FOREST PROBLEM IN THE WEST

VOL. V. SEPTEMBER, 1899. No. 9.

The Forester

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devoted to the care and use of
forests and forest trees and
to related subjects.

THE U. S. FOREST RANGER SYSTEM

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PORTO RICAN FOREST RESOURCES

MINNESOTA'S PROPOSED NEW PARK

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A GROVE OF WILD CHERRY (PRUNUS SEROTINA), IN NORTH CAROLINA.

A very valuable timber for inside furnishing and for making fine furniture.

The Forester.

VOL. V. SEPTEMBER, 1899 No. 9.

The United States Forest Ranger System.

An Official Review of the National Forest Reserves and their Administration.

BY THE COMMISSIONER OF THE GENERAL LAND OFFICE OF THE DEPARTMENT OF THE INTERIOR.

Much has been written as to the theory of forest preservation and the resulting benefits, but little is known, to the general public, of the administrative details in connection with the objects in view. It may be of interest, therefore, to the readers of THE FORESTER to be informed of some of the machinery which experience has thus far shown to be necessary and practicable.

In the eleven States and Territories of Arizona, California, Colorado, Idaho, Montana, New Mexico, Oregon, South Dakota, Utah, Washington and Wyoming there are 36 forest reserves, containing an aggregate area of about 46,000,000 acres. These reserves are divided into nine districts, each having a general officer, known as a Forest Superintendent, in charge. Each district is divided into supervisors' districts, the number depending on the number of reserves, total area and difficulties of supervision, as affected by topography and liability to fires and depredations of all kinds. For each of these supervisors' districts there is appointed an officer called a forest supervisor, who has direct charge of the reserve or a portion of a reserve forming his district. There are 39 such supervisors' districts Each reserve is divided into patrol districts, the size of each patrol depending upon topography and the liability to fires and depredations; and a forest ranger, whose headquarters shall be at some central point in his subdivision, is appointed for each such district. There are 350 patrol districts, or rangers' subdivisions, in the 36 reserves. Two hundred and fifty rangers for immediate duty were authorized May 2, 1899, to serve until October 15, 1899. One hundred additional rangers were authorized to enter upon duty July 15, to serve until October 15, 1899. The rangers report to the supervisors and are under their immediate supervision. The supervisors report to the superintendents and the superintendents report to the Commissioner of the General Land Office in Washington.

The forest superintendents are directly responsible to the Commissioner of the General Land Office for the proper administration of the reserves. They receive from the Commissioner all orders and instructions, and are required to see that they are carried out. The forest supervisor is responsible for the work pertaining to his district, and for the proper discharge of duties by the rangers, and reports to the superintendent. The respective duties of these officials are described in detail in the following pages.

The Superintendent.

The forest superintendents are required to post themselves thoroughly as to all the rules and regulations governing the reserve, as laid down in a general circular of instructions issued June 30, 1897, and reissued, with amendments, August 5, 1898: and to see that these regulations are enforced, to observe the results of their operation and to report thereon. They are to obtain information against persons violating the provisions of the forest fire law, and report it to the proper United States attorney, and to render all necessary assistance in their prosecution. They are to give special attention to the instructions regarding forest fires and to co-operate with the supervisors in all large and important fires which are liable to get beyond the control of the supervisors and their rangers, and, when necessary, to employ additional help to extinguish the fires.

They are required to study the effect of sheep grazing upon the reserves; to examine as to the question of the free use of timber and stone as provided by the regulations; timber trespasses; lands in the reserves more valuable for mineral than for timber; areas in the reserves more valuable for agricultural than for forest uses. They also have charge of the appraisement of timber to be sold, and many other similar duties. They promulgate all orders from the Commissioner, and examine and pass upon all reports made to him by the supervisors and rangers.

The Supervisor.

The Supervisor must have his headquarters in or near the reserve of which he is in charge. He must familiarize himself with all the conditions existing in his district, especially in regard to forest fires. He must see that notices of the forest-fire act of February 24, 1897, which are printed on cloth, are posted in conspicuous places in the reserve; that all campers, hunters and others found in the reserve are duly warned as to their camp fires and their attention called to the fire act. They have immediate supervision of the rangers and are required to be in and through the reserve to see that the time of the rangers is fully occupied in patrolling their districts, clearing up old trails, cutting new trails and performing their duties generally. They make weekly reports of daily service rendered, and monthly reports on the general conditions existing in the reserve. They also make detailed reports to the superintendent on forest fires, showing:

First Class: The number of camp or small fires found left burning, which were afterward extinguished by the forest officers or rangers.

Second Class: The number of fires (not included in the first class) which had gained considerable headway before being located and extinguished. Total area, in acres, burned over; number of volunteers, if any, who aided; number of extra men hired, if any, to aid; total amount paid for the extra help; amount of other extra expense incurred (not including amount paid for extra help and for tools).

Third Class: Number of large and important fires requiring extraordinary effort, time and expense to extinguish (not included in the first or second class), which were extinguished; total area, in acres, burned over; number of volunteers, if any, who aided; number of extra men hired to aid; total amount paid for the extra help; total amount of other extra expense (not including amount paid for extra help and for tools).

All Classes: Total amount expended during the month for tools, the dates of fires, the names and addresses of the parties responsible for their starting, the origin, the damage done, the probable market value of the timber burned and the effect upon the forest cover and water supply.

The Ranger.

The Rangers are required to be constantly on guard, to patrol their districts, to extinguish camp and other fires, to report to the supervisor all fires as indicated above, and to carry out their in-

structions as prescribed by a general circular dated May 12, 1899. They make monthly reports of daily service rendered, which reports are examined by the supervisors and superintendents and are then forwarded by the superintendents to the United States General Land Office.

A ranger must provide himself with horse and equipment, while the Government furnishes him with the various implements necessary to open trails in the dense forest, to construct fire barriers and to extinguish and surround fires. Each ranger is provided with a nickel badge, which is worn as an evidence of his official authority.

The official titles of the reserves and the men in charge of them are as follows:

Arizona and New Mexico.

The superintendent of the six reserves in Arizona and New Mexico is W. H. Buntain, of Santa Fe, New Mexico. These reserves have an aggregate area of 7,234,080 acres, consisting of, in Arizona, Grand Cañon, 1,851,520 acres; San Francisco Mountains, 975,360 acres; Black Mesa, 1,658,880 acres, and Prescott, 10,240 acres; in New Mexico, Pecos River, 411,040 acres; Gila River 2,327,040 acres.

This district is divided into six supervisors' districts, with Fred. S. Breen, of Flagstaff, Arizona, as Supervisor of the Francisco Mountains Reserves; *W. P. Hermann, Flagstaff, Arizona, Supervisor of the Grand Cañon; Mathew H. Rowe, Showlow, Arizona, Supervisor of the Black Mesa; W. H. Thayer, Prescott, Arizona, Supervisor of the Prescott; J. B. Wilhoit, Pecos River, New Mexico, Supervisor of the Pecos River Reserve, and Albert S. Osterman, Silver City, New Mexico, Supervisor of the Gila River Reserve.

Twenty-eight rangers were assigned to this district in May for immediate duty, and, on July 15, nine additional for the Arizona Reserves and five additional for the New Mexico Reserves, making the total force of rangers for the Superintendent's district forty-two.

The twenty-eight first assigned were distributed as follows: Grand Cañon Reserve, 5; Prescott Reserve, none (the Supervisor acting as Ranger); San Francisco Mountains, 8; Pecos River, 5, and Gila River, 5. The fourteen additional rangers were appointed as rangers-at-large, being assigned from time to time to such reserves as the Superintendent sees fit.

Northern California.

The Superintendent of the three reserves in Northern California is Charles S. Newhall, of Fresno, Cal. These reserves contain an aggregate area of 4,923,535 acres, and consist of the Stanislaus Forest Reserve, 691,200 acres; Sierra Forest Reserve, 4,096,000 acres; and the Lake Tahoe Reserve, 136,335 acres.

There are four supervisors' districts, with W. C. Bartlett, Tallac, Cal., as Supervisor of the Lake Tahoe Reserve, having also the general supervision of the Stanislaus, of which last-named Reserve George Langenberg is the Supervisor in immediate charge, reporting to Mr. Bartlett, J. W. Dobson, Raymond, Cal., Supervisor of the Northern Division of the Sierra Reserve, and Harrison White, Visalia, Cal., Supervisor of the Southern Division of the Sierra Reserve.

Twenty-six rangers were first authorized, and 8 additional, on duty at large, for assignment to duty on July 15. Of those for immediate duty there were assigned to the Stanislaus 4, and to the Sierra Reserve 22.

Southern California.

The Superintendent of the five Southern California reserves is B. F. Allen, of Los Angeles, Cal. These reserves contain an aggregate area of 3,784,594 acres, consisting of the Pine Mountain and Zaca Lake Reserve, with an area of 1,644,594 acres; San Bernardino, 737,-

[Since the preparation of this article the death of Supervisor Hermann has been reported to the General Land Office. His former district has been placed temporarily under the direction of Supervisor Breen.—ED.]

280 acres; San Gabriel, 555,520 acres; San Jacinto, 737,280 acres, and the Trabuco Cañon, 109,920 acres. They are divided into five supervisors' districts, with B. F. Crawshaw, Santa Barbara, Cal., Supervisor of the Western Division of the Pine Mountain and Zaca Lake; Willis M. Slosson, Nordhoff, Cal., Supervisor of the Eastern Division of the Pine Mountain and Zaca Lake; W. A. Buick, San Bernardino, Cal., Supervisor of the San Bernardino, and W. A. Border, Los Angeles, Cal, Supervisor of the San Gabriel. The Trabuco Cañon and San Jacinto form the other supervisors' districts over which Mr. Buick will soon assume jurisdiction, a contingency caused by some special work, and Grant I. Taggart will take his place as Supervisor of the San Bernardino.

Forty-five rangers in May and June, and 10 entering on duty July 15 were authorized. There have been assigned to the Western Division of the Pine Mountain and Zaca Lake 8; Eastern Division of Pine Mountain and Zaca Lake, 8; San Bernardino, 8, and to the San Gabriel, 12.

Colorado and Utah.

The Superintendent of the five reserves in Colorado and the two in Utah is W. T. S. May, of Denver, Colorado. These reserves have an aggregate area of 4,046,720 acres, comprising, in Colorado, the Battlement Mesa, 858,240 acres; Pike's Peak, 184,320 acres; Plum Creek, 179,200 acres; South Platte, 683,520 acres, and the White River Plateau, 1,198,080 acres, In Utah, the Fish Lake, 67,840 acres, and Uintah, 875,520 acres.

This district is divided into seven supervisors' districts, each reserve constituting a district. E. C. Carter, Colorado Springs, Colo., is the Supervisor of the Pike's Peak Reserve; Oliver T. Curtis, Debeque, Colo., of the Battlement Mesa; Stephen H. Standart, Pine, Colo., of the South Platte; Frank J. Steinmetz, Colorado Springs, Colo., of the Plum Creek and White River Plateau, and George F. Bucher, Coalville, Utah, of the Uintah and Fish Lake reserves.

Sixteen rangers were assigned in June for immediate duty, and 18 additional entered on duty July 15. Of the first-named on duty 2 were assigned to the Pike's Peak Reserve, 2 to the Plum Creek, 3 to the South Platte, 2 to the the Battlement Mesa, 3 to the White River Plateau, 1 to the Fish Lake and 3 to the Uintah.

Idaho.

The Superintendent of those portions of the Bitter Root and Priest River Reserves lying in Idaho is James Glendenning, of Grangeville, Idaho. This area consists of about 3,997,160 acres—about 3,456,000 acres of the Bitter Root and 541,160 acres of the Priest River Reserve being in this State.

There are three supervisors' districts, the Bitter Root having two. Benton Mires, Elk City, Idaho, is the Supervisor for the southern part of the Bitter Root, and W. D. Robbins, Grangeville, Idaho, for the north end. Robert S. Bragaw, Priest River, Idaho, is the Supervisor of the Priest River.

Fifteen rangers were assigned for immediate duty—10 to the Bitter Root and 5 to the Priest River Reserve. Eleven at large for duty from July 15 were authorized.

Montana.

The Superintendent of all the reserves in Montana is J. B. Collins, Missoula, Montana. These contain an area of 5,040,000 acres, comprising that portion of the Bitter Root Reserve lying in Montana, with an area of 691,200 acres; the Flathead 1,382,400 acres; the Lewis and Clarke, 2,926,080 acres, and the Gallatin, 40,320 acres.

Each of these constitutes a supervisor's District, John B. Weber, Hamilton, Montana, being the Supervisor of the Bitter Root Reserve in Montana; Gust Moser, Missoula, Montana, Supervisor of the Lewis and Clarke Reserve, and W. J. Brennan, Kalispell, Montana, supervisor of the Flathead Reserve. No

supervisor for the Gallatin Reserve has yet been named permanently.

Twenty-nine rangers were assigned to these reserves in June for immediate duty, 8 being for the Bitter Root, in Montana, 9 for the Flathead, 6 for the Lewis and Clarke and 6 for the Gallatin. There were also authorized for these reserves, on July 15, 9 additional rangers, for assignment to duty at the discretion of the Superintendent, making a total force of 38 rangers.

Oregon.

The three forest reserves in Oregon—the Cascade Range Reserve, area 4,492,800 acres; the Bull Run, area 142,080 acres, and the Ashland, area 18,560 acres, or an aggregate area of 4,653,440 acres—constitute a Superintendent's District, of which S. B. Ormsby, Salem, Oregon, is the Superintendent.

There are three supervisors' districts, the Northern Division of the Cascade Range Reserve and the Bull Run being under the supervision of W. H. Dufur, Dufur, Oregon; the Central Division of the Cascade Range forming another supervisor's district, under Ralph B Dixon, of Roseburg; and the Southern Division and the Ashland another, in charge of Nat Langell, Jacksonville.

Forty rangers were assigned for the entire season—37 for the Cascade Range, 2 for the Bull Run and 1 for the Ashland.

South Dakota and Wyoming.

The Black Hills Reserve, in South Dakota and Wyoming, the Teton, the Yellowstone National Park Timber Land Reserve, and the Big Horn Reserve, make a district of which C. W. Garbutt, Sheridan, Wyoming, is the Superintendent. The total area of these reserves is 4,407,840 acres, the Black Hills, in South Dakota, having 1,166,080 acres, and in Wyoming 45,600 acres; the Teton 829,440 acres; the Yellowstone 1,239,040, and the Big Horn 1,127,680 acres.

There are four supervisors' districts. Charles Deloney, of Jackson, Wyoming, is the Supervisor of the Teton and that portion of the Yellowstone lying immediately south thereof; A. D. Chamberlain, Cody, Wyoming, is the Supervisor of the remainder of the Yellowstone National Park Reserve; W. N. Jackson, Big Horn, Wyoming, is the Supervisor of the Big Horn Reserve, and H. G. Hamaker, Custer, S. D., is the Supervisor of the Black Hills Reserve.

Twenty-seven rangers—9 for the Black Hills, 5 for the Yellowstone, 8 for the Big Horn and 5 for the Teton were authorized for immediate duty in June, and for duty July 15 9 additional for the Black Hills and 9 additional for the Wyoming reserves.

Washington.

The Superintendent of the reserves in Washington is D. B. Sheller, Tacoma, Washington. These contain an aggregate area of 8,121,880 acres, comprising that part of the Priest River Reserve which lies in this State, area 103,960 acres; the Washington, 3,594,240 acres; the Olympic, 2,188,800 acres, and the Mount Rainier, 2,234,880 acres.

The Washington and Priest River form a supervisor's district, of which Edward Burin, Custer, Washington, is the Supervisor; F. C. Mathewson, of Shelton, is the Supervisor for the Olympic, and George McCoy, of Napavine, for the Mount Rainier.

Twenty-three rangers—8 for the Washington, 6 for the Olympic and 9 for the Mount Rainier—were authorized for immediate duty, and for duty on July 15 eleven more as rangers at-large.

In concluding this review it may be proper to state that only persons physically, as well as otherwise, qualified are selected for the position of ranger Old age, indolence, weakness and intemperance are disqualifications which, when made known to the Department, will lead at once to the dismissal of the objectionable ranger. These officers are the sentinels in the forest, and absence from their post of duty is not permissible. This regulation guarantees constant vigilance in the hour of fire peril or timber depredation.

BINGER HERMANN.

The Forest Problem In The West.

Being a Paper Read at the Summer Meeting, Los Angeles, Cal., 1899.

(NUMBER FIVE OF THE SERIES.)

BY THE PRESIDENT OF THE FOREST AND WATER SOCIETY OF SOUTHERN CALIFORNIA.

The economic interest of the American people in their forests everywhere, and especially in the West, is to preserve the integrity and water-holding power of the mountain water-sheds of the country. This is clearly the public interest, whether these mountain water-sheds could or could not support by their products and wise use a system of management guaranteeing the integrity of their water-holding power. The public interest is both economic and humanitarian in preserving the mountain forest covering. Without forest preservation most of our remaining wild public land districts cannot be settled, and districts already settled are likely to lose in man-sustaining power. This has occurred already over wide areas of the world from undue forest denudation, on the one side by the irregular or exhausted water supply and on the other by the destructive action of flood and torrent through sudden rainfall delivery from bared areas. The proper preservation of forest balance does not require that ripe timber should not be cut, or that other uses, such as mining, should not be enjoyed.

The interest and requirements of districts vary in what treatment of forested areas is most advantageous. In most of the West and in all of the Southwest, the conditions of topography, rainfall and climate exact the highest care and treatment of the comparatively small forested area, all of which in the Southwest is on mountains or high plateaus only.

In this district it were better, for the country and for its people, that no use should be made of forest lands or forest products than to have the forests wasted and burned as at present is generally being done.

However, no such drastic remedy as the isolation of the forests from human use is necessary. Under a proper and intelligent forest system the integrity of the water-sheds can be safely maintained, and yet plenty of use can be found for both land and products; uses that can go on without fatal results to the forested area.

It is only in the extreme southwestern mountains that the conditions are such as to counter-indicate the cutting of any timber or even firewood in the mountains. But even here mining, resorts, power companies and irrigation works can be established with no disadvantage to the trees or chaparral, but rather to their increased safety. The nation can gain by preserving its forests in safe proportion, and can in no way consent to see this proportion of safety to its people diminished. The nation will gain by forest preservation even though the system be without any resources or power of self-sustenance.

While forestry has become a living issue in the Atlantic States, through the depletion of perennial flow of springs and streams and increased flood action, and probably by greater and increasingly injurious extremes of frost and heat arising from forest destruction, in the West and Southwest effective forestry is a question of life or death.

With irrigated districts, present or prospective, the conservation of the Forest Natural Reservoirs is at least as important as the conservation of any part of the rainfall by artificial storage diversion or distributing systems.

The lands on the mountains and water-sheds in this part of the United States are in large part Federal public lands. By the extensive reservation of forested mountain lands from sale or settlement, the Federal Government has committed itself to a rational forest system. What the situation demands and what the

people desire is a forest management of these important mountain water-sheds that will serve the highest interests of the entire community. Interests built up under the neglect and waste and abuses of the Government's forestal mistakes and laches should be treated with all the consideration that the safety of the communities affected and the welfare of the great majority of the people will permit.

All foresters, and especially all foresters in the Southwest, endorse, and must endorse a Federal forest policy, whether the forest management pays its way or not.

The Government forestry systems of European nations, of Canada, Algiers, India and Australia, are self-sustaining, and for the most part bring in considerable revenues. Curiously enough, it is in the countries like Spain, Arabia, Persia and Turkey, in which forestry is neglected, where national productive power has most diminished, and in which both nation and people individually are poorest.

The success of other countries in maintaining national forest systems invites our attention to this subject.

The principal revenue from all forest systems is from the sale of forest products. These are mainly merchantable timber and fuel. The Western districts in which the principal areas of public lands exist, are situated so that one part or another of California would resemble their conditions closely enough for preliminary plans and outlines of forest management appropriate for the entire Western public land area.

California contains mountains and plains, valleys, farm lands and deserts. In the northwest its climate is one of, if not the moistest in the United States; in the southeast it is one of the most arid. In the Redwood belt there is a very large rainfall, and almost continuous fog and mist between the rainy seasons. In the Cocopah desert years pass without a drop of rain, or even a cloudy day. California conditions, carefully considered, can do much to outline a forest and public land policy. What is the public land situation here?

California contains 99,361,083 acres of land, of which

The area appropriated is	40,392,418 acres.
The area unappropriated is	43,841,044 "
The area reserved is	15,127,621 "
	99,361,083 acres.

This gives a substantially accurate picture of our land situation. In the other Western States the public lands are in much larger proportion, as an annexed table will show.

The above figures, however, do not give the exact facts. Of the appropriated area some has gone to the State for taxes. In some of the mountain counties this tax area is quite considerable. The State Comptroller and the county officers thus far have found no general record of this tax land, therefore no one can now tell to what it amounts.

Of the area reserved, a considerable part is patented and in private hands. In some reserved districts, the proportion of private holdings is large, in others very small.

The National Yosemite Park, of about one million acres area, is a little more than half in private hands The San Gabriel Reserve, from the Cajon West has a very small proportionate area in private hands, while the San Bernardino part of the forest reserves of the South has a considerable area in private hands.

The Reserve System suggests the policy of Switzerland. In that republic experience has demonstrated the immediate and often awful results of forest denudation on steep, high mountains to lower agricultural lands.

From this experience has been evolved a forest system which lays out as a part of its functions forest reserve districts. The lands within these, whether public or private, are under public control, and not a tree can be cut without public authority. We may come to this system some day.

There are in this State about 83,000 square miles of public lands in the hands of the Federal Government. An

examination made by expert civil engineers on section lines, and mapped by the old State Board of Forestry, shows in its reports that the mountain land with merchantable timber is substantially all in private hands. There is, speaking generally, no timber of merchantable quality and accessibility in California not in private hands.

Fuel and small wood costs more to bring out of the high Sierras at present than it will bring. There are restricted districts where the waste and fallen wood, or small standing timber could pay its way for use as ties, posts, fuel or mining, but no large revenue is in sight from this source at present. Consequently, the sources of revenue and support of foreign systems is absent in California.

We may assume that the known conditions of California in this respect in one or another of its districts apply to those of the entire West.

There is, however, a source of revenue to the Government from a rational management of its mountain forest lands, when handled in conjunction with the development by public irrigation works of the vast area of arid public land.

The reason why there is such a large amount of public land in California and in the West generally, is that the land is all in an arid climate, and that it is therefore incapable of supporting a farmer or settler, without a secure supply of water for irrigation, and often for domestic use.

The mountain forested areas are all incapable of agriculture in the Southwest. There is consequently no gain of productive area, as in the settlement of Ohio, for instance, by denuding them. On the other hand, these forests are the natural reservoirs of the Southwest.

The forests in this section are of the highest importance both to the irrigation districts already developed, and also to the enormous areas that may by future irrigation works be made fertile.

Storage reservoirs, diversion works, ditches, etc., are all safer and more permanent when under a forested watershed than when under a bare one. In the first case, with forest covering, there is a minimum of flood action, and practically no torrential detritus to fill up the works. From a denuded water-shed, the water delivery is irregular, torrential and detritus-laden.

The public land now at its limits, or near its limits of support of population, can, by judicious irrigation works, be made capable of supporting a population of between fifty and one hundred millions. Irrigated land has always been as capable as that for supporting the densest population from agricultural returns. We see this in the history of the Euphrates and the Nile. In both of these cases, and in the more modern developments in India, we see that the important works were carried out by the community or Government, were managed by the community, are thus managed, and that new work for further development in the application of water to land in genial and dry climates, such as those of India and Egypt, is planned or being executed solely as Government undertakings.

There are three good reasons with us for this policy. The first is that the lands susceptible of improvement are largely public lands. The second is that the undertakings are too large for most private initiative, and the third is that a public administration of irrigated lands is the only one in which the land occupants can feel safe in not becoming serfs of the water company, as is now practically the case in the rich, irrigated valley of the Po, where the returns are large, but the people in misery.

Governments in the past and Governments now recognize the advantage and propriety of making their lands productive by public irrigation works. The peoples who have done this in the past have been among the greatest. One of the most powerful governments of the present day, that of Great Britain, is now, as it long has been, engaged in such irrigation development. The dam on the River Nile, near Assouan, will be the greatest land reclamation work in the world. The values created by the

application of water to land in Egypt will far exceed the values created by the exclusion of water from land in Holland. Both are Government undertakings.

In this country the Government has undertaken land reclamation by excluding water, as by the Mississippi dykes. It has also added to land-values and product-values by the construction of harbors and canals, thus reducing or removing freight tariffs or lighterage and landing tariffs The States on, or having rivers, have been benefited by this policy. So also the Coast States, or those on the Lakes or served by the great Sault Ste. Marie Canal have been benefited; so has the country generally been benefited.

It is eminently proper that the people's Government should apply this policy to the development of the rich and sunny Western lands that cannot produce and serve mankind without water. In this case the benefit is direct to the public. It is the public land that will be most benefited. It is homes for the people that will be created. It is of course markets and a high productive power population in our own bounds that we thus create. It is the conservative agriculturist that we thus introduce and encourage to balance the more radical bodies of employes in the great manufacturing districts. Fifty million such Americans will consume more American products and support more American trade than all our present foreign trade combined.

Taking the public land area as a whole we find some that is inherently worthless, some that can be made good and productive, some where forests and their products can be safely used under reasonable regulations, some where the forests can only be safeguarded, but not used, as in the chaparral mountains of the South, and a wide district that is at present used for pasturage, excessive and premature. The pastures thus constantly deteriorate and carry less stock.

The public land pastures have deteriorated and are deteriorating in stock and sheep-carrying power. Fighting and disorder is everywhere present among the pasture users. Sometimes they have wars. These stock and sheep men, as far as seen, welcomed a proposed system of leasing the public lands appropriate to pasture, under judicious restriction as to the number of stock permitted on each section and the time of year when the stock should go on. The public lands in California have a present value for pasturage that varies with seasons. It is estimated to have an annual rental value of not less than $250,000 and may exceed half a million dollars. Its rental value varies with the seasonal rainfall. The stockmen would be glad to pay rent and thus know upon what feed they could rely, without the present accompaniments of murder and arson.

Those districts where pasturage injures the water-sheds could have the stock reduced to a safe number by reasonable regulation or entirely removed.

When we consider the vital importance of the entire forest question, and past and present precedent in the matter of forestry and irrigation; when we consider the effect of forest denudation in filling up navigable rivers and harbors, the importance of water to miners, to cities and to irrigators; when we further reflect on the empire at our hand and in our borders to be created by irrigation works, we can agree that forests, reservoirs and public land management all go hand in hand.

The land system as a unit can be self-supporting and revenue producing. All interests can be fairly dealt with and the country brought to its highest productive power.

Those who engage in promoting this great work have strenuous efforts before them; they deserve the garlands of reward as civic patriots as much or more than those who foment distant foreign wars. The conquest of this empire within our bounds for our own children is more useful, more profitable, more secure and more glorious than any foreign conquests can ever be.

ABBOT KINNEY,
Los Angeles, Cal.

Minnesota's Proposed New National Park.

An Organization Formed in Chicago to Secure the Perpetuation of Natural Grandeur at the Headwaters of the Mississippi River.

The most important forest reserve project ever inaugurated by public sentiment in the United States was successfully launched at Chicago on August 11. The meeting was held at the Chicago Athletic Club, where there were assembled deputations of prominent citizens from Minneapolis, St. Paul, Duluth and Chicago to consider the feasibility of creating a grand national park and forest reserve about the headwaters of the Mississippi River in Northern Minnesota.

This section is one of marvelous natural beauty, where there are eleven hundred lakes replete with fish, untrammeled forest wilds abounding in game and an ozone unsurpassed. By those who have lived and hunted in that region its value as a health-resort is highly regarded. Its location is one easily accessible to great numbers of people.

Prominent among those who have recognized the advisability of pre-empting these lands for the public, before timber pillagers and forest fires have marred the beauty of nature, has been Col. John S. Cooper, of Chicago. Two motives impelled him to arouse public sentiment to action: First, the duty of the National Government to take such action as should make the headwaters of the Mississippi common property forever; second, the preservation for historical, educational, sport and pleasure purposes of a region which otherwise, if left alone, is doomed in a short time to become a barren waste, denuded of timber, crossed by dry water ways, unfit for agriculture and the scene of disastrous timber fires.

The enthusiasm evinced at the preliminary meeting, to which reference was made editorially in the August FORESTER, left no doubt as to the immediate success of the plan to form a national organization. This having been done the future seems propitious for favorable action by Congress in consummation of the project.

"The Minnesota National Park and Forestry Association" was the title adopted for the organization, and officers were chosen as follows:

President —Cyrus M. Northrop, President of the University of Minnesota.

First Vice President. — Theodore Roosevelt, Governor of New York.

Second Vice President—Judge Horace L. Burton, of Tennessee.

Third Vice President.—Judge Hubbard, of Cedar Rapids, Iowa.

Treasurer. — John H. Whitbeck, of Chicago.

Corresponding Secretary.—Col. John S. Cooper, of Chicago.

Recording Secretary.—H. M. Bracken, of St. Paul.

Executive Committee.—Mayor Carter H. Harrison, of Chicago; C. S. Dennis, E. W. Blatchford, C. L. Hutchinson, George M. Nelson, Messrs. Beard, Clark, Gray and Work, G. G. Hartley, A. G. Comstock, S. H. Stewart, F. M. Stevenson, F. W. Leavitt, W. B. Mirschon.

The object of forming the association is thus described in the constitution adopted:

"The object of this association is to preserve as a great national park, so far as practicable, the native forests, waters and topography of an extensive tract of land in the northern part of Minnesota, together with the wild game in the woods, that an intelligent system of forestry may be established therein, and that our citizens may have, for generations to come, a great region abounding in native and cultivated forests and waters, to which they can resort in search of health and enjoyment, and that preservation and renewal of the forests may be inaugurated in the central Western States of the Union.

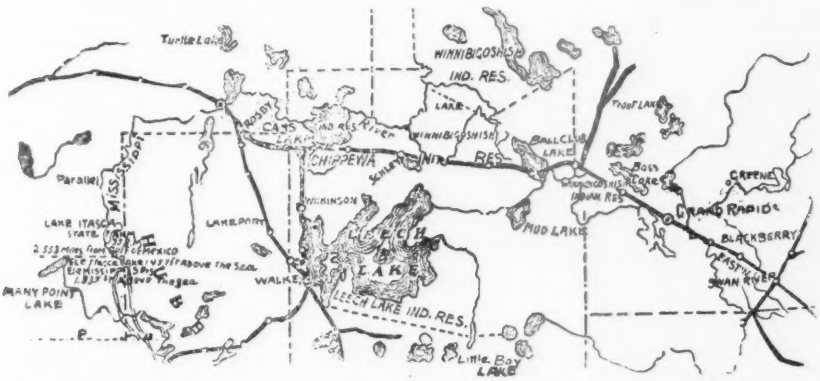
"Any citizen of the United States of good character and in sympathy with the object and purposes of this association shall be eligible to membership, and shall become such member when elected by the executive committee of the association, but no dues shall be required from members. The funds necessary to carry out the object and purposes of this organization shall be raised by voluntary contributions, and shall be paid to the treasurer, to be by him disbursed as directed by the executive board."

In order to assure a more general appreciation of the project and the desirability of early action by Congress, it was decided to take a delegation of Congressmen and other prominent public men on a trip of investigation to the Leech Lake country early in October—the Indian Summer there—in order that they may gain personal knowledge of the proposed reserve. The following resolution was passed providing for the trip:

"Whereas, It is believed that there are no legal or practical obstacles in the way of establishing a national park in the northern part of Minnesota, which may not be overcome by the joint action of Congress, the State of Minnesota and private parties having vested interests in that territory, and that by bringing the representatives of all those interests together the objects of this association will be facilitated; therefore be it

"Resolved, That this association shall immediately organize for an expedition into that region during the coming Autumn, and that the following gentlemen be appointed a committee to have full charge of the same, viz:

Col. John S. Cooper, C. L. Peck, John H. Witbeck, Otis R. Glover, Marvin Hughitt, Jr., Wesley M. Lowrie, Henry S. Fitch, O. W. Nixon, George E. Cole, L. W. Pitcher, Harry G. McCartney, Dr. Frank Billings, W. C. Brown, T. P. Shonts, B. Thomas and J. B. Clow, of Chicago; Thomas H. Shevlin, Thomas Lowry, James Gray and C. A. Pillsbury, of Minneapolis; George R. Finch, George C. Squires, Charles Cristadoro, J. I. Hill and Charles S. Fee, of St. Paul.



MAP OF THE REGION WHICH CONGRESS WILL BE ASKED TO SET ASIDE AS A NEW NATIONAL PARK.

The only circumstance lacking to make the spontaneity of thought and action complete was the reluctance of the Duluth delegates to enter heartily into the scheme, for fear of certain commercial disadvantages to that city by the withdrawal of nearby lands from settlement, if included in the proposed reserve.

Congressman Page Morris presented this view of some of his constituents, but added that all would approve if the

project would not conflict with the interests of Duluth people.

Colonel Cooper replied, calling attention to the fact that two hundred thousand tourists a year to such a reserve might be of greater financial interest to Duluth than the trade of scattered settlers in that region, after forest fires had devastated everything.

Mr. Christadoro said the efforts now being made were to save for posterity "a few hundred acres" of forest land in Minnesota, and that those who criticized did not sufficiently understand this intention. He pleaded for recognition of the necessity of preserving natural forests for the benefit of future generations.

The Duluth delegates were assured that no part of the purpose of the forest reserve organization is to interfere with the ownership of merchantable Pine, or the rights of Indians or settlers already on the ground. When this is generally understood by those having interests involved, it is believed that their cordial support will be enlisted forthwith.

Various sub-committees will be appointed on finance, press, etc., by the executive committee. There is every prospect of good results for forestry in general from such energetic efforts.

Those who took part in the final organization of the project, were:

Chicago—Col. John S. Cooper, Henry S. Fitch, George E. Cole, S. C. Eastman, Dr. Nixon and F. S. Baird.

Minneapolis—Mayor Gray, S. F. Johnson, Vice President Board of Trade; Drs. Beard, Bell, Moore, Crafts, T. H. Shevlin, A. H. Linton and F. W. Leavitt.

St Paul—Drs. Bracken and Hutchinson, Ross Clark, George M. Nelson, Charles Christadoro and E. V. Smalley.

Duluth—Col. C. H. Graves, Congressman Morris, F. A. Patrick and J. C. Hunter.

Forest Conditions of Porto Rico.

Review of the Forest Resources of the Island, by the Special Agent of the U, S. Geological Survey, for Issue by the Department of Agriculture.

FIRST PAPER—CONDITIONS AFFECTING FOREST GROWTH.

A FEW EXTRACTS FROM THE ADVANCE SHEETS.
(BY COURTESY OF THE SECRETARY OF AGRICULTURE.)

Porto Rico was originally mantled by forests from the level of the sea to the summit of its mountains. It is doubtful if there was a single foot of its area which was not at some time covered by tree growth, varying in height from the diminutive mangrove bushes which border the seashore to the gigantic deciduous trees mingled with the fronds and trunks of towering palms, which add height to the loftiest peaks and ridges. To understand the distribution and natural occurrence of these, it is necessary to explain briefly the topographic and physical features of the island.

The island is the most eastern and the smallest of the four Great Antilles. But though it nowhere attains the great altitudes of the other Antilles, the island is practically the eastward continuation of the Antillean chain of uplifts, the upward extension of a remarkable submerged mountain slope, which, at least on the north side, descends nearly 30,000 feet to the bottom of the Brownson Deep, until recently supposed to be the deepest hole in the world. The island is 95 miles long, 35 miles wide, and has an area of 3,668 square miles. It is 500 square miles less in area than Jamaica. Its area is 300 miles greater than that of Delaware, Rhode Island and the District of Columbia combined, and 1,300 square miles less than that of Connecticut. At the same time, in proportion to area, it is of

all the Antilles the most productive, the most densely settled, and the most established in its customs and institutions. It is also notable among the West Indian group, because its preponderant population is of the white race, and because it produces food-stuffs almost sufficient to supply its inhabitants, in addition to its exports to some of the neighboring islands.

Its outline presents the appearance of an almost geometrically regular parallelogram, nearly three times as long as broad, with its sides following the four cardinal directions. The sea line is nearly straight, and the coast is usually low, especially on the southern side, although there are a few headlands. It is void of fringing keys and deep indentations of its coast, such as border Cuba. The coast line is 360 miles.

Porto Rico, like all the Antilles, in comparison with the United States, has a configuration ancient in aspect, although comparatively new in geologic age. Of the four chief topographic features of the Great Antilles (central mountains, coast-border topography, interior plains and enclosed mountain basins) only the central mountains and coast-border topography are represented upon this island.

The central mountains are largely of one physiographic type. The coast-border topography is more complex and diversified, consisting of three subtypes, which may be called coast hills, parting valleys and playa plains. The mountains constitute the major surface of the island, approximately nine-tenths of the whole. The other features collectively make an irregular and lower lying belt around the coastal margin comparable to the narrow rim of a high-crowned alpine hat.

The whole island is practically an elongated elevated sierra made up mostly of volcanic rock, surrounded by a narrow collar or dado of limestone hills, former marginal marine incrustations which have been elevated. Viewed from the sea, these mountains have a rugged and serrated aspect, consisting of numerous peaks and summits with no definite crest line, rising from a general mass, whose steeply sloping sides are deeply corrugated by drainageways; they present the aspect of a wrinkled handkerchief—a figure of description ascribed to Columbus in telling Queen Isabella of the Antilles. Their superfice has been etched by erosion into innumerable lateral ridges, separated by deep gorges.

The main crest line extends from Mayaguez on the west through Aibonito and Adjuntas to Humacoa on the east. This is called the central Cordillera west of Aibonito and the Sierra de Cayey east of that town.

There are virtually two crest lines in the eastern half of the island. The northern branch is the Sierra Luquillo, which practically extends from the west of the San Juan-Ponce military road to the northeast cape. This range contains the highest island summit, El Yunque.

These mountains, as a whole, when looked down upon from the highest points, present the aspect of a sea of conical peaks and beaded ridges, rather than a dividing ridge. The highest eminences of the billowy summits nowhere exceed 3,500 feet, and this altitude, if attained at all, is reached by only one peak that of El Yunque, at the extreme northeast. The height of this peak is given on the Spanish maps at 4,087 feet, but it is reported much lower by other authorities. Other summits of the island, although numerous, hardly anywhere exceed 3,000 feet.

Through the mountainous mass numerous and copious streams ramify in every direction. These have deep valleys singularly free from cliffs, and they etch the surface into many lateral ridges and points. Of these streams, the largest and longest drain into the north coast, the next largest flow to the west, while the streams of the south and east sides, although copious, are comparatively short. The upper ramifications of the three principal rivers of the north coast reach southward nearly across the island.

Besides the wide alluvial plains near the mouths of the streams, to be described

later, the lower stretches of these northern streams present considerable areas of bottom land, extending for some distances within the margin of the mountain area, rarely broadening out into local circular mountain valleys. Their upper portions are steep angular gorges, however, where habitations are confined to the slopes and not the valleys. There are other streams of the island which also present small areas of bottom land indenting the mountanous area for a very short distance from their coastal borders, notably the Portugues, near Ponce on the south, and the Anasco on the west.

The most unobservant traveler remarks the radical natural differences which take place upon passing from the mountains into the lower lying coastal plains and foothills, especially upon the south side. The coast-border topography comprises a narrow belt of low hills and plains encircling the main or mountainous mass of the island, and broken in continuity upon the northeast, southeast and west by spurs of the central mountains which run across it into the sea. This border region of itself is an exceedingly diversified area, presenting two conspicuous major types of relief, coast hills and playa plains, and generally a third type, which may be called parting valleys.

On the north the coast hills stand as steeply sloping solitary mounds or domes, rising singly or in chains above wider extents of plain lying between them and the mountain front. The citadels of San Juan are built upon a hill of this character; others rise to the east and west of the city as far as Rio Grande and toward Arecibo.

Along the shore from the southwest cape of Porto Rico to within three or four miles of Ponce, except where occasionally broken by playas, coast hills are finely developed. These hills, like those of the north coast, are the remants of what was once a steeply slanting bench plain. The slant is from the central mountains toward the sea, where the hills are in some places terminated by a steep scarp or sea bluff 100 feet in height. The interior side scarp of these hills is bordered by a valley occupied by the lake of Guanica, separated by still another row of hills called the cerros from the central mountains.

On the southwest end of the island there are two parallel rows of hills separated from each other and the interior mountains by long and fertile valleys. The interior chain of hills, which extends from north of Cabo Rojo to within three miles of Yauco, passing west of San German, is of a peculiar type not seen elsewhere on the island. It is a single chain of highly rounded wooded hills of the type called "knobs" in this country, and "cerros" by the Spaniards. They owe their configuration to a thick cap stratum of hard mountain limestone, the lower portion being composed of the softer decomposing rock. Where the cap has been removed erosion has widened the valleys into great elongated plains or vegas.

For want of a better, the term "playa plains" is used for the wide alluvial plains found at more or less frequent intervals along the entire coast between the hills which limit them. The word "playa" means literally "shore" or "strand." Many cities of Porto Rico are situated upon the interior border of such plains where they meet the foothills, several miles from the port of entry, which is located at the immediate seashore, and which is usually designated "playa," in order to distinguish it from the city proper. These playa plains are usually fan-shaped in area, with their broader base next to the sea, where they are often many miles in width, and stand only a few feet above the ocean. They are bordered by escarpments composed of the sharp rise of the coast hills, and extend with constantly decreasing width backward up the stream valleys toward the central mountains. Ponce is situated upon a typical playa plain, which extends a short distance back of the city up the valley of the Rio Portugues. To the west of Ponce the playa plains are quite exceptional.

The name "parting valley" the writer has given to certain long and narrow valleys which sometimes occur between the foothills and the front central mountains. Some of the streams, as they emerge from the mountains and cross the lower country, tend either to bend along the mountain front as they pass from it or to send out laterals parallel to the same. The erosion attendant upon such phenomena produces long parallel valleys at the junction of the mountains and foothills. Parting valleys of this character are especially well developed on the south side of Porto Rico, such as the plain of Saba Grande and the depression of Guanica lagoon. Other parting valleys of a similar character are developed in many places around the rest of the island, although perhaps not quite so extensive in area.

Several features which are more developed upon the other Great Antilles are exceptional or lacking in the configuration of Porto Rico—notably, interior mountain valleys, bordering benches of elevated coral reef, the coast lagoons or lakes, and the mangrove swamps. The interior mountain valleys of Porto Rico are not conspicuous features, nor are they completely closed (without drainage outlets), like those of Jamaica.

Elevated reef benches or *seborucco*, which in Cuba form the narrow coast rim of hard rock and protect a softer interior, thereby producing the excellent pouch-shaped harbors, are but faintly developed in Porto Rico. This material was seen only at the entrance of San Juan Harbor. The coast lagoons or lakes are collections of water in swales of the coastal plain on the north and in parting valleys of the type of Guanica, previously described. Mangrove swamps are extensively developed around the interior margin of San Juan Harbor.

In the Southern United States and the Antilles, where altitude is not a controlling factor, the chemical and physical composition of the soils are two of the chief factors producing vegetal differences. Inasmuch as the soils of Porto Rico, with the exception of that of the playa plains, are all residual (the surface decay of the underlying rock), it is impossible to make a clear presentation of the forest conditions without a few remarks upon the nature of the rocks. Inasmuch as all cultural and natural aspects are intimately associated with geologic structure, a few words upon this subject are absolutely essential to a complete understanding of the subject. But in a brief review, such as this, having called attention to the omission, we may speak briefly, not of the history, but only of the present condition of the soils.

The chief and radical differences of flora in Porto Rico occur between the red clay mountain soils and the calcareous foothill soils, the latter being of the open-textured white limestone type which abounds from Florida southward, but is not common in the United States.

The mountain areas present but little if any barren indurated rock surface, but are covered with a deep red soil, to which vegetation clings tenaciously. This mountain soil is one of the most marked features of the island, and to it are largely due many of its agricultural and forest conditions. Were it less tenacious and sticky than it is (and language can hardly convey an idea of the unctuousness of this stickiness, which is especially disagreeable in a road material) the mountain slopes of Porto Rico would now be washed and dreary wastes of barren rock. This mountain soil is mostly red ferruginous clay, accompanied by much pebble and other rock debris. It is naturally ameliorated by the vast amount of humus derived from the native vegetation. Decay is so rapid under perpetual warmth and moisture that the volcanic rocks quickly rot and weather into soils of this character. The regolith or decayed superfice of the rocks is unusually deep on these mountains, extending down 50 or 100 feet, correspondingly affording a splendid medium for root hold and penetration.

Owing to this soil the mountains were originally wooded and are now cultivated to their very summits, verticality of slope presenting no obstacle to cultivation in

the minds of the natives. The writer has seen the steepest possible slopes cultivated to the highest degree in coffee and tobacco; in fact, the most productive crops of this character are grown upon declivities upon which the American farmer would not risk limb and life.

Much of the soil of Porto Rico is now abandoned and in the condition known throughout the English-speaking West Indies as "ruinate." This has resulted from long cultivation, from the failure to apply fertilizers, and, in some cases, from erosion. Land of this character was observed in many parts of the island. The reclamation of these lands by forestry, or the methods of scientific agriculture, is one of the problems which Porto Rico presents to the civilization of its new owners.

Regarding the climate of Porto Rico, no attempt will be made to describe it other than to state a few facts relating to its bearing upon the distribution of life and culture. The whole island may be divided into a wet and a dry belt, on the north and south sides of the central Cordillera, respectively. The greatest rainfall, which sometimes attains 120 inches a year on the slopes of El Yunque, is at the northeast end. On the south side, from Guayama to Cabo Rojo, the climate is dryer, but most of the island is wet in comparison with the standard of the United States.

The higher mountains are slightly cooler than the coast belt, but the temperature is so uniformly warm that altitude has but little bearing upon distribution of vegetation. The mountains are constantly bathed in moisture, either by daily rainfalls or dense mists which collect upon them at night, except upon the lower portion of their southern slopes; hence, it may be said that the superfice is never dry and the subsoil is constantly saturated in the mountain region.

On the southern coast, however, owing both to the porosity of the limestone, which quickly drains off the moisture, and to the intermittent dryer periods, the surface above has a parched and arid look, especially in the long dry season. Some portions of this south belt are very arid, and great complaint was heard in places that the rainfall for the past two years had been insufficient for domestic supply. In fact, to cultivate the staple crops of the lowlands of the south coast, irrigation is necessary. This is practiced with great skill and at considerable cost along the whole southern border from Guayama to Cabo Rojo.

[Continued in next issue.]

Ontario Forest Reserve.

The Ontario government is making rapid progress toward the adoption of a complete system of reforestation, having recently set apart an important reserve in Frontenac and Addington Counties.

After inquiries from time to time as to the most eligible territory for a reservation in the eastern part of the province, the Commissioner of Crown Lands came to the conclusion that the McLaren limits, now operated by Isaac Allan, of Mississippi Station, were the most suitable for the purpose. These limits cover parts of the townships of Abinger, Miller, Barrie, Clarendon, Palmerston, Ashby, Denbigh, Effingham, South Caninto, Olden, North Sherbrooke and Oso, and contain an area of 273¾ miles. The territory is watered by numerous lakes and streams and lies on the headwaters of the Mississippi River, a stream of considerable importance flowing into the Ottawa River, and on the headwaters of a branch of the Madawaska River. All the good land available has been either sold or located, and the merchantable pine timber has been almost entirely cut away. The Pine growth remaining consists of young trees springing up, which are spread over considerable areas of the territory, and, if protected from fires and allowed to attain a fair growth, will, it is deemed, become a valuable asset of the province in the near future.—*Canada Lumberman.*

The American Forestry Association.

A Special Meeting at Columbus.

The American Forestry Association held a special meeting at Columbus, Ohio, on August 22 and 23. The meeting was held under the auspices of the Columbus Horticultural Society, and the arrangements made by the officers of that organization were all that could be desired. As an affiliated society of the American Association for the Advancement of Science, all privileges of accommodations and entertainment, as well as railroad rates, were shared by members of the Forestry Association.

The sessions were held in Horticultural Hall, Ohio State University. At 2 o'clock on Tuesday afternoon, August 22, the meeting was called to order by William R. Lazenby, President of the Horticultural Society, who was made chairman of the convention. The attendance was not large, but all present manifested a deep interest in the proceedings and evinced an enthusiasm that was inspiring.

Among those present at this and the subsequent sessions were: Dr. W. J. Beal, Vice President for Michigan of the American Forestry Association, and Professor of Botany and Forestry in the Michigan Agricultural College; Dr. C. E. Bessey, of Nebraska State University, Vice President for Nebraska; Rev. James Poindexter, President of the Ohio State Forestry Bureau; S. C. Mason, Professor of Horticulture and Forestry, Berea College, Kentucky; William Saunders, Director of the Canadian Experimental Farms; Dr. B. B. Halsted, of the New Jersey Experiment Station; Prof. A. D. Hopkins, of the West Virginia Experiment Station, Vice President for West Virginia; John F. Cunningham, Secretary of the Columbus Horticultural Society; Prof. J. A. Holmes, Vice President for North Carolina; Prof. L. C. Corbett, of West Virginia University; J. J. Janney, Columbus; Prof. F. W. Rowe, of the New Hampshire Agricultural and Mechanical College; Prof. N. L. Britton, Superintendent of the Botanical Garden, Bronx Park, New York City; W. R. Beattie, Columbus; T. A. Scott, Westerville; F. R. Luke, Ohio State University; Prof. J. H. Lageman, Columbus; J. F. Cowell, Superintendent of Parks, Buffalo, N. Y.; William R. Lazenby, Professor Horticulture and Forestry, Ohio State University, and President of the Columbus Horticultural Society; L. M. Freeman, Rex, Lecturer on Forestry.

Telegrams and letters of regret were read from Gifford Pinchot, Forester of the U. S. Department of Agriculture; Dr. C. A. Schenck, Forester to the Biltmore Estate, North Carolina; W. W. Ashe, Consulting Forester, Raleigh, N. C.; Prof. John Craig, Iowa Agricultural College, Ames, Iowa; George W. Minier, Austin, Ill., and others.

In a brief opening address Professor Lazenby welcomed the Association to Columbus. Speaking of the rapid and reckless destruction of the forests of Ohio, one of the best agricultural States in the Union, he called attention to the average annual rainfall of Ohio, and whether it had been materially increased or its distribution greatly modified by the removal of the forests. "We do know," he said, "that our soil rapidly loses its summer moisture; that our springs and wells are failing and our streams and rivers are more capricious in their flow; droughts are more severe and floods are more common." He urged the planting of trees upon all land that was not cultivated or that was cultivated at a loss.

After the appointment of a committee on resolutions and hearing verbal reports from the members representing different States, a formal address was delivered by Rev. James Poindexter, president of the Ohio Forestry Bureau, on the past

and future work of that department. John F. Cunningham also read a paper on "Observations upon the Woodlands of Ohio."

The session then adjourned, the remainder of the afternoon being spent in an inspection of the native trees and shrubs on the grounds of the State University.

At the morning session of the second day the following papers were presented and read: "Natural Regeneration of Forests on Old Fields in Eastern Kentucky," by Prof. S. C. Mason, of Kentucky; "Lumbering in Northern Michigan," by Dr. W. J. Beal, of Michigan; "The Rate of Growth and Temperature of Various Varieties of Forest Trees," by William R. Lazenby, of Ohio; "Capitalistic Review of Conservative Lumbering," by C. A. Schenck, of Biltmore, N. C.

These papers will be fully considered in coming issues of THE FORESTER. A discussion was then held on twenty questions, which had been printed upon the programs, relating to the extension of general interest in Forestry, and the characteristics of various trees, conditions of growth, insect enemies, etc. This proved to be a very profitable feature of the session.

During the afternoon a number of short excursions were taken to view large and unique specimens of native trees bordering the Olentangy River. Before the close of the meeting the Committee on Resolutions presented a report which was unanimously adopted.

A paper on "Are the Trees Advancing or Retreating upon the Nebraska Plains?" was read by C. E. Bessey, of Lincoln, Neb., at the meeting of the section on botany, of the Science Convention.

Results Will Compensate.

The Minnesota forest reserve scheme will need the co-operation of the General Government, and it will doubtless receive it. Both the last and the present national Administrations have shown their sympathy with forest preservation movements. During the past five years a number of large national parks have been created from Government lands. One of the latest of these is the Lake Tahoe Forest Reserve in California, consisting of 136,335 acres which was set aside by the proclamation of President McKinley last April. The Government will continue this policy and other bodies of public land will be withdrawn from sale and created into parks. One of the chief objects of the proposed Minnesota reserve is to protect the headwaters of the Mississippi River. The need of this is plain, and it should encourage the promoters to persevere in their plans notwithstanding the difficulties to be overcome. The results will compensate for all the labor and patience involved.—*Editorial, Philadelphia Press.*

Investigation of Red Fir.

The Division of Forestry of the Department of Agriculture at the present time has sixteen men in the State of Washington gathering data regarding the growth of Red Fir and how best to keep the land in a productive condition. Fir is a rapidly growing timber and Gifford Pinchot, chief of the division, believes that with proper care there should be a perpetual supply which should maintain Washington as a great lumber producing State in perpetuity.—*Amer. Lumberman.*

A Popular Parasite.

The mistletoe has become so popular as a Christmas decoration in England that it seems likely to be exterminated in certain places. It was formerly permitted to grow in many apple orchards, sometimes seriously injuring the trees, but with the increased demand this has all been removed. In some places steps are being taken to propagate it, and young apple trees can now be purchased on which the parasite has become established.—*Plant World.*

Forest Protection.

Minnesota's Example.

The annual report of the Chief Fire Warden of Minnesota, Gen. C. C. Andrews, has been recently sent out, and shows a very satisfactory and aggressive enforcement of the laws relating to forest fires.

The object of the fire warden law is to prevent great forest fires from starting, or if, unfortunately, they have started, to extinguish them before they become unmanageable. Prevention is the main feature of the law, as is seen in the importance attached to posting and publishing warning notices. Thus far the State has expended, under this law, less than $5,000 a year, including the one third of county expenses which it pays; and the expense of the thirty-odd counties affected by the law has averaged less than $100 a year, yet the State has escaped the heavy losses suffered by nearby States.

Reports from the fire wardens, made to the Chief Fire Warden, of forest fires in 1898, show that there were fifty-one such fires, which burned over 21,580 acres, much of which was light timber or cut-over lands. The total damage reported, $9,063, is accounted for in part by some of the damaged timber being cut the succeeding winter. Seventy-eight per cent of the whole number of fires reported were extinguished or controlled by fire wardens or their helpers. A man in Todd County was made to pay a fine of $100 and costs for carelessly causing a fire which spread a half mile into a neighbor's field, where it fatally burned a woman and severely injured a boy who tried to protect her. There were several other vigorous and effective prosecutions. The number of acres reported as burned over by prairie fires was 54,360; damage, $13,436. The number of such fires caused by burning grass, straw or stubble was 23; by railroad locomotives, 14, other causes 5, unknown 25.

The report contains numerous illustrations of the Minnesota forests, describes some of the timber country in Beltrami and Cass Counties, also a splendid Pine forest on the south shore of Cass Lake, recently made accessible by railway; and some very fine forest on the north shore of Vermillion Lake, belonging to the State University, which the Chief Fire Warden advocates being set apart as a demonstration forest for the use of the school of forestry connected with the Agricultural College and Experiment Station. If this were done, he thinks the State University of Minnesota would outrank all other Universities except Cornell in this country in the important science of forestry, which is so rapidly coming to the front. The need of roads and paths in the Itasca State Park is commented upon.

There is a splendid review of European forestry, historically considered. In proportion as the people are informed in regard to forestry will they be disposed to use precaution against the ravages of forest fires. The importance of setting apart primeval Pine forest lands as a health resort is urged upon the State.

Forest Fire Laws in Pennsylvania.

Dr. J. T. Rothrock, State Forestry Commissioner of Pennsylvania, and Vice President of the American Forestry Association for the Keystone State, said, in a recent statement to the Philadelphia "North American":

"The recent destructive forest fires in Centre County bring prominently forward the laws which were passed by the Legislature of 1897 for the suppression of forest fires, and the question may be raised, and doubtless will be, are these laws effective?

"The best answer to this is found in the fact that ten years ago the loss to this State by forest fires was estimated, by those most competent to judge, at $1,000,000 annually. In 1896 the loss was $557,056. In 1897 it was $394,327. With every effort on the part of this

office to secure information, the loss to the State by forest fires in 1896 only sums up $53,345. In other words, something has caused a gradual decrease in forest fires during the ten years past from $1,000,000 worth of property destroyed to $53,345—that is a saving in one year of $946,655.

"The Spring of 1899 was remarkably dry as the trees were coming into leaf. An unusual number of forest fires were started in Luzerne, Lackawanna, Pike and Monroe counties, as well as in some other counties. There always will be such seasons, and we may expect that they will show an increase in the usual number of forest fires until we are authorized by law to throw over the affected districts such thorough protection as is afforded by other civilized countries.

"The fire laws passed in 1897 are two. First, the act of March 30, 'making constables of townships ex officio fire wardens for the extinction of forest fires, and for reporting to the Court of Quarter Sessions violations of the laws for the protection of forests from fire, prescribing the duties of such fire wardens and their punishment for failure to perform the same, and empowering them to require, under penalty, the assistance of other persons in the extinction of fires.' This act has been upheld by the Supreme Court.

"The second act was approved the 15th day of July. This act makes it the duty of the County Commissioners 'to appoint persons under oath, whose duty it shall be to ferret out and bring to punishment all persons or corporations who either willfully or otherwise cause the burning of timber lands within their respective counties, and to take measures to have such fires extinguished where it can be done,' and it provides a penalty for failure on part of the County Commissioners to attend to this duty.

"The obvious duty of the State is to protect its citizens against those who ignorantly, carelessly, or with criminal intent would waste or destroy property. It is, therefore, the duty of Commissioners of counties where forest fires prevail to make an honest effort to apprehend those who start them.

"Unless a general rain occurs within a reasonable time, we have cause to fear that destructive forest conflagrations will happen elsewhere than in Centre County, and the officers named in the laws above mentioned would do well to weigh very carefully their responsibility under the circumstances."

An Enlightened Policy.

During the present year the State has come into possession by purchase of additional large tracts of the Adirondack forest. This acquisition has been made under the special law and appropriation passed at the instance of Governor Black.

The reclamation of these woods from private ownership is an enlightened policy. The entire "wilderness" should have remained a heritage for all the people of the State. Its benefits as a magnificent park, a conservator of the water supply and an unequaled sanitarium could not be estimated. But while various clubs and individuals have secured possession of some of the choicest portions of the great tract, there is enough left under State control to constitute the finest State park in the world if it is properly guarded and cared for.—*New York World.*

The Dawn of Success.

While most of the States have not taken any notable steps in the direction of scientific forestry, or of any adequate care of the forests that remain to them, yet in nearly all of them the subject is now engaging the attention of earnest and thoughtful men. The campaign of education in favor of forest preservation has begun to achieve successes in all parts of the Union. The people are beginning to understand more and more clearly the importance of the issue and the urgent necessity of applying a remedy to the evil of the careless wasting of our noble woods.—*San Francisco Call.*

THE FORESTER.

A MONTHLY MAGAZINE

Devoted to Arboriculture and Forestry, the Care and Use of Forests and Forest Trees, and Related Subjects.

ANNOUNCEMENT.

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The patriotic interest of the American people in everything pertaining to the new colonial possessions has prompted the publication of a review, which, while not exhaustive, is sufficiently full to answer the great majority of questions of immediate interest concerning forestry in Porto Rico. It embraces the results, in part, of observations made during a rapid reconnoissance through the military department of Porto Rico by R. T. Hill in January, 1899, during which he became familiar with its forests, and, by inquiry among various persons engaged in wood-working trades, obtained valuable information as to the qualities and uses of the native timbers. The complete report contains not only a clear statement of the forest resources of Porto Rico and the extent of its timber lands, but also such succinct descriptions of the physical features of the island as are necessary for an understanding of its forest problems. It will shortly be published by the Department of Agriculture.

An announcement of interest to all who appreciate the undoubted advisability and necessity of forest conservation in this country, is the appointment of Hon. John Gifford, of Princeton, N. J., to a chair of forestry at Cornell University. Mr. Gifford gave early evidence of his earnest consideration of the subject as well as of his zeal in promoting a scientific investigation and popular realization of forestry in general, in the founding of the "New Jersey Forester," which made its appearance at the beginning of 1895. As editor of the new magazine he worked assiduously for the advancement of the cause, and as proprietor showed that convincing enthusiasm which cannot be dampened by mere lack of financial support. The magazine having developed under his capable management into an organ of considerable influence, far beyond the bounds of its original scope and local character, Mr. Gifford consented to a continuance of its publication by The American Forestry Association. Through this medium THE FORESTER has reached every part of this country, and finds interested readers also in Canada, England, Germany, France, Italy, and even India, all of whom will follow with interest the further efforts of Mr. Gifford in his chosen field.

The position which Mr. Gifford has just accepted is the Assistant Professorship of Forestry, which was offered him immediately upon his receiving the doctor's degree in forestry at the University of Munich. He will take up his new work in the early Autumn, when there will be offered to the student body the following courses under his care: Forest protection, forest administration, forest history and politics; forestry, with special reference to silviculture; and German forest literature.

An interesting description of the country included in the proposed new National Park in Northern Minnesota will be a feature of the October issue of THE FORESTER, which will also contain further papers of the Summer Meeting at Los Angeles, additional notes of the special meeting at Columbus, and a report of the meeting at Missoula, Mont.

An able article, of especial value to those whose interests are linked with forestry through irrigation, will treat of percolation and water supply, as affected by forests—a subject which has attracted very considerable attention.

The work of State organizations, in arousing general public interest in forestry, will be described by taking the example of an active organization—that of Massachusetts.

Among other features of this and following numbers will be articles presenting views on forestry as applied to mining, sheep grazing, agriculture, and storage reservoirs. The articles on colonial forests will be continued.

CHIPS AND CLIPS.

India-rubber heels on shoes, decreasing the fatigue of marching, will be adopted, it is said, by the French army.

Port Blakely, Wash., recently sent a steamer laden with three million feet of lumber to Taku and Woosung, China.

The hardwoods in the vicinity of Cadillac, Mich., are estimated at eleven billion feet, of exceptionally fine quality.

Notwithstanding a law to prevent the pollution of streams by mill refuse, the Ottawa River is reported to be filled with sawdust.

At the Paris Exposition of 1900 the Canadian exhibit of forestry will be under the supervision of J. M. Macoun, of Ottawa. A complete collection of native woods will be shown.

A large quantity of standing timber, including Elm, Basswood, White and Red Oak, Sycamore, Whitewood, Birch and Soft Maple, in Ontario, has been sold to a syndicate to manufacture for export to British markets.

North Africa claimed a cargo of nearly half a million feet of Canadian lumber in the beginning of the month, four-fifths of it going to Tunis and the remainder to Morocco. Buenos Ayres took a cargo even larger than the preceding.

The distinction of having produced the best quality of Cork White Pine ever grown in North America is accorded to the Cass River country, Michigan. Since 1864 nearly a billion feet of logs have been rafted down that river.

Tamarack gum is being sought in Canada by a patent medicine company or use in its preparations. The tree grows well in the highlands of new Ontario, north of the height of land, but is found only in swampy places in the older part of that province.

In parts of South America where Mahogany is used for railroad ties and other ordinary uses, the native business men are said to prize the cheap Hemlock and Pine boards which are sent in the form of boxes and crates from this country.

The Chinese propensity for decapitation has manifested itself in an unusual way recently. Li Hung Chang is reported to be one of the leading promoters of a huge lumber-mill project in China, to give some of the forest monarchs the *coup-de-grace*.

A forest reserve is likely to be established in the Lake Temagamingue district of Ontario, as the result of a visit by the Commissioner of Crown Lands. A dense growth of White Pine exists all around the shores of the lake greatly in excess of what was previously known.

The timber supply of Georgia has been estimated by lumbermen of that State as sufficient to last only nine years at the present rate of sawing, 2,600,000 feet daily. The timber resources of the State at present are placed at one and a half million acres, calculated to saw three thousand feet to the acre.

The finest Spruce area in Canada, as it is claimed to be, will be opened to development by the new Restigouche & Western Railway, which is now being constructed. The line extends from Campbellton, N. B., a distance of 110 miles to St. Leonards, on the St. John River, to a region hitherto inaccessible.

Although Colorado has considerable timber, it is of coarse quality, suitable only for the roughest uses. It is estimated that four-fifths of the lumber and timber used in the State is imported. White Pine comes from Wisconsin and Minnesota, a large amount of Yellow Pine is used, while the products of Oregon and Washington mills also finds a regular market.

Forest Fires in Three States.

Cheyenne, Wyoming, Aug. 27.—Forest fires are raging about Laramie Peak, in the northern portion of Laramie County. They have been burning for the past ten days, and have destroyed a large quantity of valuable timber.

Deadwood. S. D., Aug. 27.—A fire has been raging in the timber east of this city in the Two Bit District for the past twenty-four hours. The country is very dry, and fears are entertained that the fire will get beyond control. Sixty range riders are fighting the flames.

Denver, Colo., Aug. 27 —Forest fires, which it is thought were started by camp fires, are raging in the foothills near the entrance to Platte Canon, about twenty miles south of here. The fires started five miles up the canon, and burned over the mountains on both sides of the canon and are now devastating the timber section along the foothills. Millions of feet of lumber have been consumed, and there are reports of loss of life.

The Power of Public Sentiment.

The Connecticut legislature has passed a law protecting the trailing arbutus. This is said to be the first law ever passed in any State of the Union for the protection of a wild flower. A newspaper article calling attention to the need of such a law is credited with having aroused sufficient public sentiment to secure the passage of the law.

Aboriginal Simplicity.

A novel tramway is in operation in British Columbia. It is formed of trees from which the bark has been peeled off, being firmly bolted together and used for rails. Upon these runs a car with grooved wheels ten inches thick. The tramway is two miles long.

An Alaskan Enterprise.

The Alaskan trade is becoming the center of important lumber developments. A newly-organized company at Seattle, Wash., has secured large timber concessions, consisting of hard Cedar of an exceptionally fine quality, on the west coast of Alaska Sunny Point, on Prince of Wales Island, has been selected as the industrial center of the business, with stores on Cholmondelay Sound.

A Relic of Old Manila.

Rosewood and Mahogany attract the attention of visitors to the Hotel Orient in Manila. The interior is described as being beautifully finished in hand-sawed wood, the staircases of the first three floors being of Rosewood. Solid Mahogany forms the floors, the boards being twenty-two feet long and two and a half feet wide. Though in use twenty years, these boards are still in perfect condition.

A Friendly Suggestion.

Now that some attention is being paid by the most practical of lumbermen to forest subjects, the forest primer recently issued by the Division of Forestry of the Department of Agriculture at Washington will be assured of a wider circulation and more general study than would formerly have been the case. Timber owners are coming to realize that there are many comparatively inexpensive methods by which their interests can be conserved and their properties, to some extent, preserved from the dangers which threaten them by fire and insect pests. These are treated of quite elaborately in this so-called primer, which is such mainly because of its style and the direct and simple way in which the questions with which it deals are presented. The time is at hand, moreover, when more attention will be paid than in the past to conservative methods of lumbering, and it is not too much to hope that some of the simpler and less expensive methods of forest culture will be put into practice. At any rate, there are many lumbermen and timber owners who will read with interest this book, and perhaps find in it some suggestions of value to them in the conduct of their business.—*Editorial, American Lumberman.*

Recent Publications.

"Orchard and Forest Tree Culture" is the title of a pamphlet printed by order of the English Parliament and now being circulated. It gives the complete evidence of the official horticulturist, W. T. Macoun, of the Central Dominion Farm, Canada, before the Committee on Agriculture and Colonization of the House of Commons.

Mr. Macoun appeared in response to the committee's request for such information as would enable them to care for the interests of tree-owners generally. He described fruit-tree culture at length, answering many questions of the committeemen, and then spoke of his study of forest trees.

"Taking the forest belts, which cover an area of about twenty-one acres," he said the objects of planting were to find out how long it would take trees to reach a certain height; the rapidity of growth of each variety; the proper distance apart to plant to get the best results; and the value of trees as wind-breaks for crops grown in the vicinity of them.

"During each year the heights of a large number of trees in this belt are taken, and the data published. This will be valuable when the time comes to reforest parts of Ontario, and I think that time is not far distant.

"It has also been found that much depends on the way in which trees are planted, and the proportion of thick and thin-foliaged kinds there are in the belts. For instance, if a farmer plants a few acres of Ash expecting to reap a large crop in twenty-five or thirty years, it is likely he will have to expend a great amount of labor to bring these to perfection, because the Ash is a thin-foliaged tree. By mixing some thick-foliaged trees, such as Box Elder, Maple, or other sorts, planted as a cover crop for the ground to prevent the growth of weeds and to obtain proper forest conditions, he will be able to get the best conditions in the shortest time at the least expense. These are a few of the objects and advantages of the forest belt."

Several North American trees either new or little known, are described by Prof. C. S. Sargent in the *Botanical Gazette*. One of the trees is a new Elm (*Ulmus serotina*), with a trunk forty to fifty feet in height and from two to three feet in diameter, which has long been confused with the Cork Elm (*U. racemosa*). It is an autumn-flowering species, and thus easily distinguished from all others. It is found on the banks of the French Broad River near Dandridge, Tenn.; on limestone bluffs of the Cumberland River near Nashville, Tenn.; near Huntsville, Ala., and Rome, Ga.

A magnificent new Palm is also described under the name of *Serenoa arborescens*. It is thirty or forty feet in height, with one or several stems only three or four inches in diameter. The leaves form a crown at the summit of the stem, and are two feet wide and long, and are on petioles about two feet in length. It grows on the margin of swamps near the Chockoloskee River in Southwestern Florida. In order to accumulate sufficient material to determine the status of this and other little-known forms, Professor Sargent made several exploring trips to the Keys of Florida.

NOTE.

The edition of THE FORESTER for November, 1898, having been exhausted, it has been found necessary to have a new one printed. Members of the Association and subscribers who may need copies of that issue (No. 11, Vol. IV,) to complete files for binding, will be supplied if they notify the publishers to that effect.

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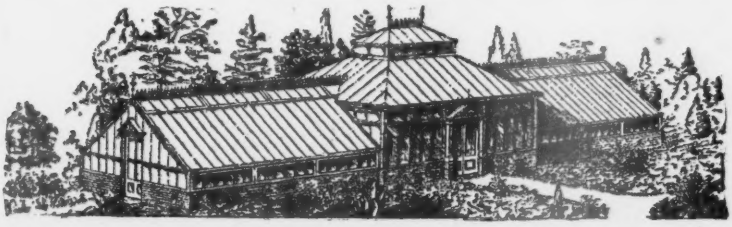

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